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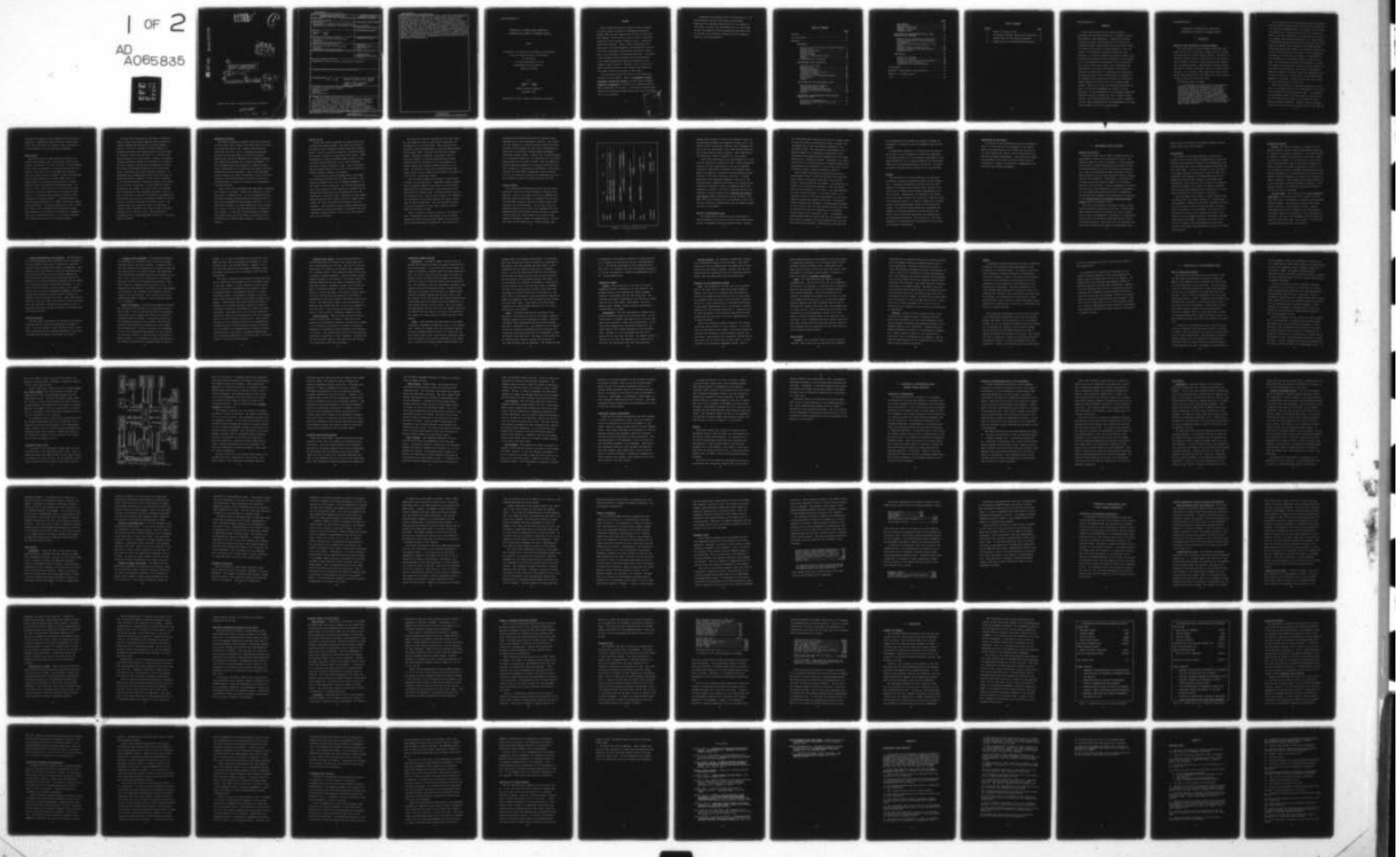

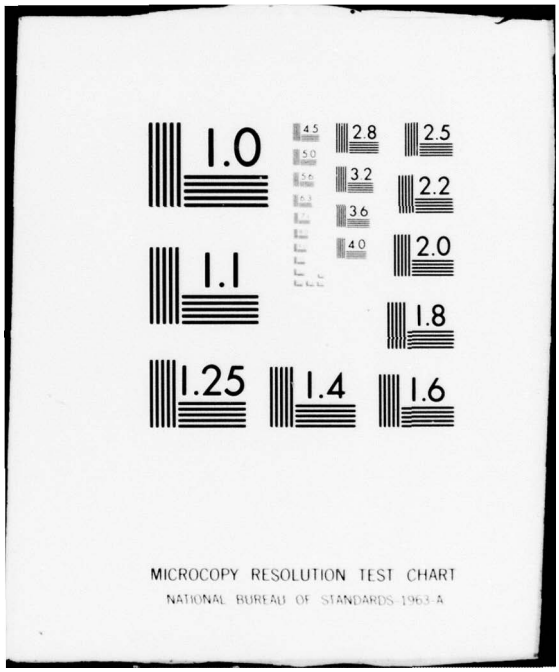
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The Air Force Directorate of Contract Appeals (AFLC/JAB) has encountered difficulty in managing information needed in case preparation. Problems with manual information systems overload and lack of attorney time prevented adequate representation for the Air Force before the Armed Services Board of Contract Appeals. Also, the conduct of an effective litigation preventation was difficult. In order to remedy this situation several pilot computer-based systems had been

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EVALUATION OF COMPUTER AIDED INDEXING OF INFORMATION FOR SUPPORT OF CONTRACT APPEALS

THESIS

Presented to the Faculty of the School of Engineering

of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the

Requirements for the Degree of

Master of Science

by

Ronald D. Vargo
Capt USAF

Graduate Systems Management

September 1978

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preface

While examining potential topics for thesis research, the writer noted an interest in Management Information Systems (MIS) by many organizations in the Air Force Systems Command. Since the writer did not have a sufficient background in the concepts involved in MIS, a literature search was conducted. Also, a small organization, the Directorate of Contract Appeals, was experimenting with the use of MIS technology and the writer was asked to assist them in the evaluation of system possibilities. The nature of the problems and the timetable for the requirements study closely approximated the time available for the students thesis research. Therefore, since it would be a useful learning experience, the research was undertaken. This paper contains the results of this study.

Two references proved very useful in the background research for this thesis. These are Management Oriented Management Information Systems by Jerome Kanter and MIS A Managerial Perspective, a collection of readings edited by Dock, Luchsinger, and Cornette. These works suggested many aspects of information systems design that needed consideration in this research.

In addition, the assistance of Dr. Keith Womer, Lt. Col Adrian Harrell, and Maj. Saul Young was envaluable, especially for exploring possibilities for the conduct of this study. Finally, Mr. Glenn Woody and Col. John Murphy of the Directorate of Contract Appeals provided many hours of guidance and information, without which this research would not have been possible.

TABLE OF CONTENTS

LIST OF FIGURES

ABSTRACT

The Air Force Directorate of Contract Appeals (AFLC/JAB) has encountered difficulty in managing information needed in case preparation. Problems with manual information systems overload and lack of attorney time prevented adequate representation for the Air Force before the Armed Services Board of Contract Appeals. Also, the conduct of an effective litigation preventation was difficult. In order to remedy this situation several pilot computer-based systems had been developed, but they needed to be tested against the requirements of the Directorate. This thesis consists of a study of the requirements and evaluations of the costs and benefits of two feasible equipment configurations. To accomplish the evaluations, the expected costs of both configurations is compared to the personnel costs that would be required to achieve the needed capabilities without the use of computer-based systems. Both of the use of time sharing systems and the use of a dedicated minicomputer are found to be cost effective, but the procurement of a minicomputer-based word processing system is expected to lead to greater overall savings. The conclusions offered also include a suggested plan for system implementation and recommendations for additional research that can be accomplished.

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EVALUATION OF COMPUTER AIDED INDEXING OF INFORMATION IN SUPPORT OF CONTRACT APPEALS

I. Background

Mission of the Directorate of Contract Appeals

The Directorate of Contract Appeals (AFLC/JAB) represents the Air Force in contract disputes before the Armed Services Board of Contract Appeals (ASBCA). The ASBCA is a Government agency with full authority to act for the Secretary of Defense to settle contracts made with all Department of Defense agencies. JAB currently utilizes sixteen attorneys to handle a caseload of nearly two hundred cases per year. As of January, 1978, there were 228 Air Force appeal cases pending before the ASBCA with a total contested dollar value of 257 million dollars.

Proceedings before the ASBCA

> ".....are adversary in nature and the representation function requires the performance of all things necessary to present the Government's position to a trial forum including: analysis of legal issues, accumulation of evidence, the use of "discovery" for the Government and the defense of unwarranted discovery sought by Appellant, preparation of pleadings and ancillary motions, presentation of evidence, and preparation of briefs, as well as assistance to all Air Force procuring activities in the settlement of appeals where appropriate." (Trial Attorney's Guide Book (TAGB), 1977:1-7).

The assistance to Air Force procuring agencies normally takes the form of legal advice on the merits of a particular case and recommended action to be taken by the Contracting Officer (CO). This advice should be on a continuing basis as the case develops but it begins during a review of all proposed final decisions issued by a CO. When there is a disagreement between the parties to a contract that falls under the disputes clause required by the Armed Services Procurement Regulations (ASPR), the contractor may ask the CO for a final decision on the matter. The CO prepares a statement of his decision, but before it is forwarded to the contractor it is referred to JAB for review and comment. The Directorate considers each decision as a potential appeal and advises the CO about the legal standing of the basis for the decision. This action is intended to reduce the number of situations where the Government would not have a sufficiently strong case if the decision were appealed to the ASBCA. During the past year JAB reviewed 323 final decisions by Air Force COs.

While the objective of litigation prevention is not a part of the formal mission of the Directorate, it is a goal of the current Chief Trial Attorney (CTA). He envisions that information about the prime causes of litigation and any new trends could be useful in the hands of the Air Force procurement community. However, with the workload existing in JAB over the past years, little if any time was

available for researching and documenting this required information. Consequently, while the files of JAB contain useful data that might help prevent future litigations, it is not currently of use to procurement personnel.

Recent Trends

While the number of cases processed by JAB has not changed significantly, their total dollar value has been steadily increasing in the last five years. This increased dollar value is indicative of increased complexity in the appeals. Since the rules of the ASBCA were revised in 1973, the primary activity of practice before the board has been pretrial discovery of evidence (TAGB, 1977:1-7). These discovery prccedures are being used to a greater degree by both the contractors and the Government. The result of this is that the volume of data that the trial attorneys of JAB must handle has been increasing dramatically. In one recent case, discovery resulted in over 7500 pages of possible evidence. In another appeal the hearing record consisted of 13 volumes, each having approximately 200 pages. The manual systems used to file, index, and retrieve this information were being severly taxed. More importantly, the ability of an attorney to adequately digest this information and use it to the best advantage was limited without the use of automated systems.

To assist law firms dealing with complex litigations cases at least least twelve companies have developed and marketed computerized systems for litigation support (Arthur, 1977;1739). The heart of these systems is a computer which helps the attorney manage the large number of documents likely to be involved in a litigation case. These systems use full-text storage, indexes, and computer programs designed to search the information for selected key words. Advanced systems have the capability to cross match several key words and selectively sort and order material chronologically (Rust and Rome, 1976:818). To complement these computerized systems, many law firms are enploying paralegal personnel to assist their attorneys. If the attorney prepares a guideline related to the issues of the case and the material is then reviewed and coded according to the issues, the initial review of documents may be delegated to these paralegal personnel. This can free a great deal of time for the attorney and increase his productivity since many of the documents produced by discovery do not relate to the specific issues at stake. The attorney might also reduce the number of times that he reviews certain documents by initially reading only those relating to one issue at a time. JAB has elected to investigate both of these approaches as solutions for their workload prblems.

Approaching Problems

The manual information systems of JAB have worked well for many years, and for many of the cases they will continue to meet the needs of JAB. Complex cases have been handled by the office, but it is becoming increasingly obvious that too much effort is currently required. Additionally, potential adversaries are becoming equipped with computerized systems for litigation management. It may be assumed that these systems will enable the Appellants to make better use of discovery and request even more information from the Government. Even if the Government did not increase the amount of material it would like from discovery, the attorneys would still need to review the increased amount of material being sent to the Appellants to avoid surprises.

There is one other development that may affect the Government cases in the future. Some of the evidence in a case may consist of computer data. It is not expected that the individual attorneys should develop the required skills to deal with, and possibly further process this data. It is conceivable, however, that some capabilities may be required if only in the form of staff assistance or outside contract support. In any case, the directorate can develop the means to deal with this potential situation, and the availability of computer based systems is a logical prerequisite.

Efforts at JAB

JAB has been defining problems and experimenting with automated information systems. The office has access to the Federal Legal Information Through Electronics (FLITE) system. This is a retrieval system for locating decisions and statutes relevant to a particular set of facts. JURIS, a Department of Justice precedent search system, is also available through FLITE; but it will soon be directly accessible through a terminal at JAB. Both of these systems can rapidly search the full text of the documents to produce excerpts, indexes, or citations.

A third system has been developed by Mr. Glenn Woody and Aeronautical Systems Division (ASD) personnel. This system is designed as an aid in document management for all phases of case preparation. It has been demonstrated that cases involving a large quantity of documents can be managed more effectively, but the system may also offer advantages in even small cases. Basically, the Law Issues Computer System (LICS) involves the use of random access storage for index information and selected, full text documents. The stored data can be recalled selectively by a programming system called VENUS, in accordance with the individual issues involved in the case or other requirements of the attorney.

The facilities used for the LICS have also been adapted, with separate files, to handling the maintenance of information on all the JAB cases. This information was previously stored and manipulated in several manual systems by the docket clerk. Detailed case data such as ASBCA number, contractor information, case status, dates of activities pending or already accomplished, and other relevant facts are stored for use in the generation of needed reports and to answer incoming inquiries on the cases. In addition to this data, information about key issues, facts, and the nature of the decision are placed in this file for a historical record.

With the manual systems this extensive data base was difficult to use effectively. Generating summary information for reports required a good deal of time and effort. Maintaining the data required a large percentage of the work time of the docket clerk. No futher use was made of the historical data. With the data stored in the computer, the information can be easily updated and readily summarized for report generation. New, more detailed, reports can now be implemented to keep other agencies informed about the activities of JAB.

Figure 1 shows the timing and nature of the efforts of JAB. In addition to the legal search, LICS, and docket systems the chart also identifies systems for case status and litigation prevention information. The case status

information was previously derived from separate forms submitted by the trial attorneys to the CTA. The information can, however, be extracted from the docket data base, and when the two systems have been fully intergrated the system will be called the Contract Appeals Management Information System (CAMIS). Finally, the litigation prevention information system is a new capability for the office, made possible by the advent of CAMIS. With the VENUS program the numerous comments on the issues, Government position, reasons for stipulations or settlements, constraining factors, and other useful information in the historical files can be searched, extracted, and summarized for use in the litigation prevention program desired by the CTA.

Outside Studies

The systems being implemented by JAB have been developed using internal Air Force personnel, equipment, and programs. Since it was known that several companies were marketing specialized systems to accomplish the functions that JAB might require, a series of outside studies were conducted for the Directorate. In the first study the suggested system was not found to be compatable with JAB operations and the estimated cost was too high to justify. A second study by E. Hugh Kinney of the Federal Trade Commission produced a number of recommendations. The general tenor of the remarks by Mr. Kinney indicated that

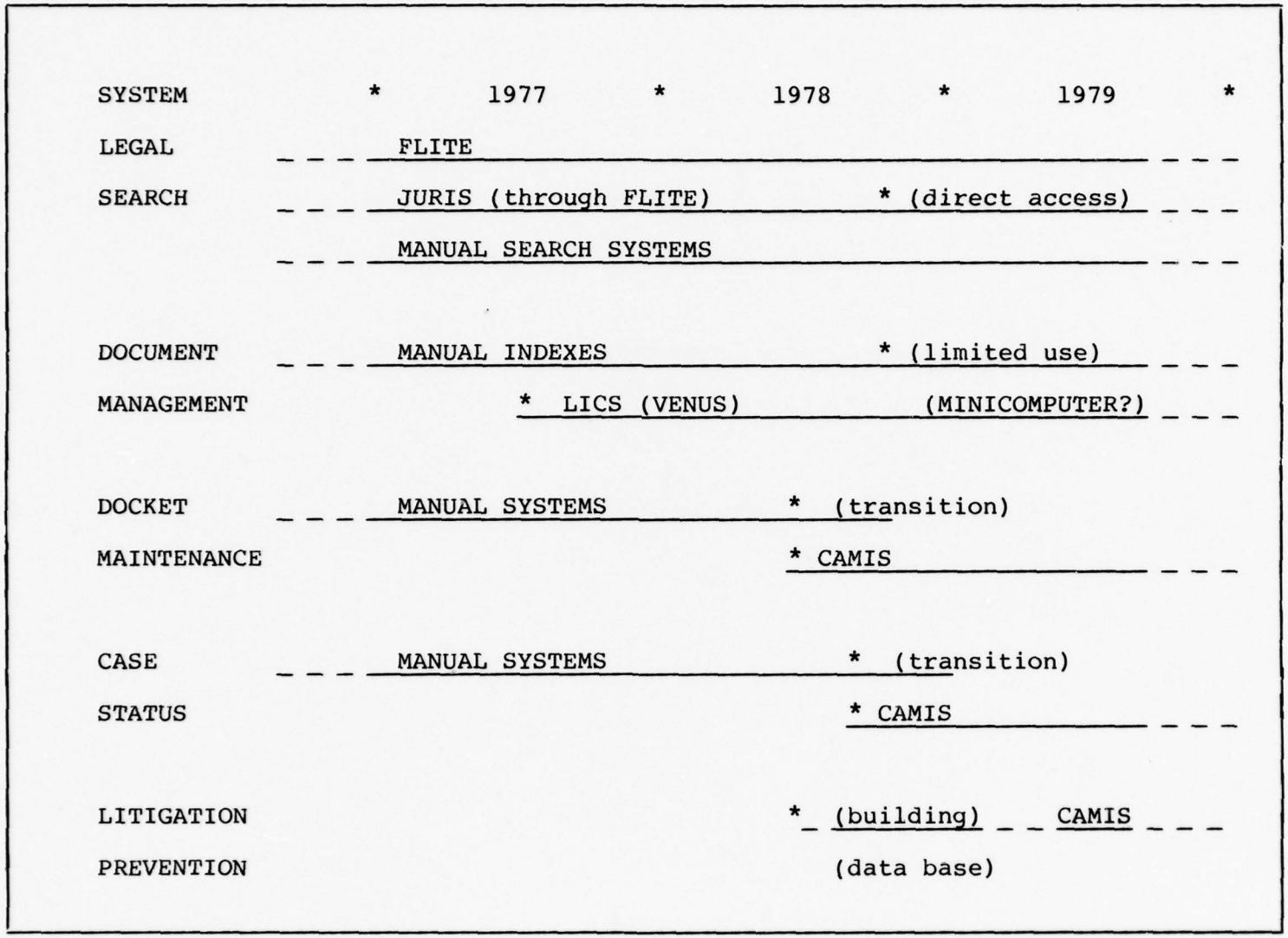

FIGURE 1. Timing of Efforts at JAB

systems were available to fulfill the desires of JAB, but no particular equipment was suggested (Kinney, 1977). The current efforts by JAB were noted and some recommendations were listed for improvement of the LICS system through the use of more powerful search programs. These improvements are discussed in depth in Chapter IV of this report.

Finally, Ms. Mary Ruprucht was commissioned for a study that was conducted in February of 1978. After studying the situation and the requirements of JAB, she recommended procuring a commercially available, mini-computer based, system to revamp the information and word processing capabilities of the office (Ruprucht, 1978:18). A primary advantage of the suggested equipment is that all of the word processing requirements of JAB must be considered and completely integrated in order to adequately design and implement the system. This type of approach has also been suggested in recent articles in the American Bar Association Journal (Walshe, 1978b:271; and Rust and Rome, 1976: 818). This type of system will be considered as one of the feasible alternative systems along with an expanded capability LICS in this report.

Need for a Requirements Study

The systems that are desired by the Directorate of Contract Appeals do not exactly meet the most common definitions of Management Information Systems (MIS). However,

the similarities were sufficient to warrant a general study of the area of MIS to determine what ideas, concepts, and techniques used in that area might be adaptable to the situation at JAB. The literature on MIS suggests that a detailed study of the information requirements of the organization be conducted before proceeding with the implementation of a computer based MIS. Futhermore, this study should lead to a characterization or flowchart model of the organization and an assessment of the current state of the information systems (Smith and Wechsler, 1973:11).

While several individuals had examined the overall requirements of JAB, it was believed that a more detailed study, based on structured interviews of the decision makers of the organization, was needed. This study and an analysis of the alternative systems to meet the requirements are the subjects of this report. The justifications for this study are numerous. A recurrent theme in the literature on MIS is that user participation in the development of information systems is critical. Two specific studies examining both successful and unsuccessful systems in the Air Force and in private industry reported that user participation was the most important of all variables listed (Carter, 1973; and Retzer, 1977). Furthermore, organizational behavior theory indicates that personnel are more likely to support and utilize systems which they feel that they helped originate. Additionally, a detailed list

of user-determined requirements was needed to enable the development of systems to have the necessary direction and purpose.

An additional advantage to be gained from the requirements study is the development of a basis for comparison. If proposed systems are to be evaluated, they should be compared through the use of selected measures of effectiveness (MOE) with the established needs of the office. The study provided the needed basis by leading to the required MOE.

Summary

The Directorate of Contract Appeals has encountered difficulty in managing information needed in case preparation. The manual procedures for dealing with the large quantity of documents and background data relating to the cases could no longer assure adequate representation for the Air Force. Additionally, the workload in the office left little time available for conducting a detailed litigation prevention program. In order to remedy this situation several pilot computer-based systems were developed and tested. The LICS and CAMIS systems were implemented but needed to be evaluated against the requirements of the office and an alternative system that was suggested by a word processing consultant. The research for this thesis consisted of determining these requirements and evaluating the available alternatives.

Organization of the Thesis

The results of the requirements study are discussed in detail in the second and third chapters of this report. Some of the implications of this study are also given in the third chapter and include a set of specifications to meet the determined requirements. The alternative systems are evaluated in the fourth and fifth chapters and the conclusions in Chapter VI include the recommendations for continuing the systems development.

II. Requirements Study Interviews

Conduct of the Study

The basic method used to gather information about the requirements of JAB was the structured interview. The questions asked are listed in Appendix A. These questions were designed to gather knowledge of the mission of JAB; the decisions made by the trial attorneys when preparing for a case; the information sources, and types, used for these decisions; and the tasks required to gather, process, and use this information. Additionally, the lawyers and the docket clerk were asked to comment on the various aspects of LICS and CAMIS. Finally, background information was solicited to help determine the training requirements for any computerized systems that might be implemented. The questions were adapted from the question set suggested in the Planning Guide for Information System Evaluation Studies (Smith and Wechsler, 1973).

The first three questions provided the general, background information required for the study. The questions that followed related to the specifics of how the objectives of JAB are accomplished. The order of the questions was such that the questions became more specific as the interview progressed. After the first six interviews, the first seven questions were deleted for subsequent inter-

views, since the information had become redundant and the answers were overly time consuming.

Data Analysis

The answers to the study questions concerning the mission of JAB, trial attorney responsibilities, decisions required and information sources for case preparation, and attorney tasks were nearly uniform among the personnel that were interviewed. It was in the areas of use of information support services, functions of an MIS for JAB, prior experience with computers, and recommendations for the systems that significant variation in the answers were encountered. This variation did not consist of completely different responses, but instead, the answers indicated several methods for approaching the problems from the different perspectives of the people in the office.

Since the sample size involved in these interviews was relatively small, no attempt was made at a sophisticated data analysis. Instead, the individual responses were used to gain an overall feeling for the magnitude of any present, or potential, future problems. The results of the interviews are given in the following sections of this chapter, with the emphasis placed on the general consensus among those interviewed. Indications are given of the extent and nature of any disagreement that was found. Finally, the helpful suggestions that were given are listed and discussed.

Background Questions

Mission. The mission statement is complete for its purpose, however, nearly everyone volunteered the additional objective of litigation prevention. Even those who were not asked to comment on the mission of the office, tended to mention the concept. If this objective is to be realized, a more efficient means of extracting information on closed casesfrom the office records would be useful. If this information could be condensed and distributed to procurement personnel, the interviewees felt that some future appeals could be prevented, or at least the litigation risk might be improved. Such information was always stored, but it was lost among literally thousands of documents. This made the concept of an effective litigation prevention program difficult to implement.

Attorney Tasks. The excerpt from the Trial Attorney's Guide Book, on the first page of this report, lists the tasks that must be accomplished to represent the Government before the ASBCA. The personnel that were interviewed thought this was a fairly complete listing. Several individuals did agree on one general task that deserved mentioning, namely, the assessment of the litigation risk involved in the case. This assessment forms the basis on which the other tasks rely. In any case it is one of the primary decisions that face the attorney.

Attorney Responsibility and Authority. The perception of the attorneys about their responsibilities and authority was that, because of the nature of their work, they are limited mostly by constraints internal to themselves. Such things as ethics and striving to save the Government money were given as limiting and driving forces respectively. The only external constraints mentioned were getting the approval of the CTA for proposed settlements and the inability to actually finalize a negotiated settlement. In the latter case the attorney can only suggest to his client, the CO, that he sign the supplemental agreement and thereby obligate the Government to expend funds or release the contractor from an obligation at issue. There have been instances, in the past, where the CO would not sign the agreement, and, therefore, the attorney was forced to go to a hearing on the matter instead of reaching a settlement that he felt was justified.

Attorney Decisions

The next topics covered were the decisions the attorney must make and the information requirements for each of them. Since the answers to these questions relate to each other, the decisions are discussed individually, along with the associated information requirements and limits.

Litigation Risk Assessment. As mentioned previously, the assessment of litigation risk is one of the primary decisions made by the trial attorneys. Litigation risk is the best estimate of the probability of losing the case and the likely amount of any adverse award. The lawyer must make a preliminary assessment based on the contents of the Rule 4 file. This file is a collection of the relevent documents from both the Government and Contractor files, that relate to an appealed final dicision of a CO. It is supplemented with information uncovered as the case preparation continues, and, therefore, the litigation risk may change as the case develops. The litigation risk is the primary determinant of whether or not the parties negotiate a settlement.

Depth of Discovery. Determining how deeply the Government should go into discovery is a second decision that must be made. After the preliminary facts are assembled, both parties to the dispute must decide what additional information might be needed. It has been the practice of the Government attorneys to go no deeper into this data collection than absolutely necessary, and rarely deeper than the Appellant. In short, the nature of the opponent is one of the information requirements for this decision. The other major factor for this decision is the amount of money at stake. It is reasonable to expect both parties to use discovery extensively on an appeal worth millions of

dollars. It is just as reasonable for the parties to not spend the time, effort, and money for discovery in a case involving only a few thousand dollars. However, in the rare case that might set an unfavorable precedent, discovery might be extensive even if the dollar value was relatively small.

The rules of discovery are designed to enable each side to the litigation to have access to all the relevant facts of the case. However, a major limitation on both parties is the difficulty of establishing what documents contain the required facts. The paperwork involved in a large government contract is staggering, and many of the documents contain data pertaining to the issues at stake in an appeal. Unfortunately, many other documents produced in discovery do not contain relevant information, and this increases the amount of work required to locate the necessary facts. Since these facts are the basic information required for nearly all the decisions of the trial attorney much of his time is spent collecting them. Other factors mentioned in the interviews affecting the information for attorney decisions include locating witnesses, availability of witnesses, the uncooperative or ineffecual witness, passage of time, lost diaries, incomplete documentation, and of particular importance in the recent past - the availability of the time of the attorney.

Relevant Legal Issues. The third major decision involves determining the relevant laws, regulations, opinions, and precedents for the case. The facts of the case should point the lawyer to the relevant legal background, but a complete search of the previous situations may uncover helpful, related precedents. There are several search systems available to the attorney. The manual systems use key-word index books and are used in conjunction with a good legal library. Automated systems, such as FLITE and JURIS, can perform detailed, full-text, searches of the material in their data bases. The largest, single, external factor affecting the availability of this type of information is the large volume of the material that is involved. The data base of FLITE is not yet complete, and there are some indications that it will not be complete in the near future. These factors are discussed in more detail in the section on information support services.

Other Decisions. There are other decisions that are made by the attorneys, as needed. Things such as the capabilities of potential witnesses, stipulations to issues not in contention, and motions to dismiss the case are evaluated in accordance with the particular circumstances of the case. The attorney relies on his training and prior experience to guide him in these situations. The advice of the CTA and other lawyers in the office may also be helpful, especially to the newer attorneys.

Information Support Services

Definition. Information support services (ISS) are systems which process raw data into usable information for the decision maker. In the legal field these systems can enable an attorney to rapidly locate the legal issues for a case. The use of such services can reduce the amount of tedious, manual work done by the attorney, and thus free more of his time for the other efforts such as fact-finding. The personnel in JAB use both manual, key-word, index systems and the FLITE automated system. Another system that may be available to an attorney is a computer based system for document storage and retrieval such as LICS. This system has not been widely used at JAB, therefore, the interviewees could only speculate on what capabilities of such systems could be of use to them. Only one attorney has experimented with the LICS, and the complete results of his efforts were not known at the time of the interviews. This system is a major subject of another section of this chapter.

FLITE. FLITE has been used specifically to do broad searches for background information, early in case preparation. Some of the lawyers felt that the system supplies too much information that not only is of little use, but also tends to make finding the relevant information harder. Since the system is not directly accessable to the attorney, as he must work through another lawyer/analyst, the

searches tend to be broader than necessary. On the other hand, one attorney felt that this might be an advantage to the system, since such searches are more likely to find references that the attorney might miss in a narrower search. It was not surprising to find that the attorneys who had used the system the most were the ones that were most proficient, and therefore satisfied, with FLITE. It is, ironically, the time that is required to learn how to use such systems that is one limiting factor to implementing them. An attorney may be too busy to take that time even though he stands to save time in the long run. One final point on this system is that the searches supplied by FLITE are incomplete, since the data base does not contain the most recent cases. Since FLITE is the only system available that contains ASBCA decisions this is a major limitation to the attorney.

JURIS. The JURIS system was not available to the attorneys at JAB during the time of this study. However, a brochure, supplied by the Department of Justice, contains information that indicated how the system would operate when JAB is connected to it. The searches will be conducted with the attorney or paralegal directly accessing the system and using certain features of the programs to guide the search of the data base. The output of the system will be selected from a range of options from citations to full-text excerpts from the documents. The information may

be displayed on the terminal, printed on a character printer, or remotely printed and sent by mail from Washington, D. C.. The CTA has high hopes for this system and feels that once it is installed, and the staff becomes proficient in its use, the system will become an indispensable part of the office capabilities.

Information Outputs

Outputs. The Directorate is the source of various documents and other information for other agencies. The primary outputs of the attorneys are formal documents submitted to the ASBCA, COs, and the contractors. The attorneys also supply information to the CTA and the docket clerk for use in the CAMIS. Additionally, the CTA is normally kept informed, through informal conferences, of the progress of the cases.

Requirements. The time requirements to supply the external information depend on the individual case. On the larger cases an attorney could spend all of his time, even days, writing motions, briefs, and interogatories. On the other hand, supplying the information required for the CAMIS requires only a small percentage of the attorney's time. Estimates of this time ranged from one to ten percent of the total time available. The highest estimate was given by the CTA, but apparently the lawyers did not feel that the requirements were that time consuming.

Possible Changes. No significant changes were foreseen in the information outputs of the attorneys. Most interviewees felt that the CAMIS should not demand more of their time than was previously required. However, the CTA anticipated that more information would be originating from his office, once the CAMIS system was fully operational.

Functions of the Information Systems

LICS. The personnel of JAB feel that manual systems, used in the past, might be improved through automation. However, since few of the attorneys have had experience working with computers, most were not able to offer specific guidance on how they would like the system to operate. The use of a trial system such as LICS would seem wasteful in many other organizations, but it did provide a learning experience for the personnel operating it. There are now at least two people in the office who understand how such systems work and can assist in the full implementation of an improved system.

Some of the attorneys offered suggestions for capabilities that would be useful in such a system. It was felt that the LICS would be most useful if full-text storage was available and information could be rapidly inputted into the system. Additionally, the information received from another ISS, such as FLITE, might be more useful if it were restored on an information management system. Both of

these suggestions would be achievable if an optical character reader were available or if the original data could be received in machine readable form. Additionally, LICS would need to be able to work with long data fields. More information is presented on this subject in Chapter IV under the heading of Equipment Limitations.

CAMIS. The CAMIS system was the subject of other recommendations. The CTA felt that, once the information was stored in the computer, it could be used to eliminate a separate form required for the case assignment process (case status subsystem). Only minor programs will be required to implement this concept, but the data will have to be updated more often than it is in the manual system. Another suggestion was that the system could be used to eliminate the "things to do" notes that the attorneys kept for their own use. Since the system can keep track of the due dates for various documents, a daily, or at least weekly, listing of upcoming dates can be supplied to the attorneys. Such a subsystem could also indicate cases that have been inactive and thus signal the need for attention. This subsystem will be integrated into the CAMIS system as time and other resources permit.

Other Factors

Training. The interviews covered two other areas of interest. The evident lack of experience with computers

indicates that an extensive training and transition period will be necessary before any automated system could be fully operational. Since the office will be hiring at least four paralegal personnel to assist the attorneys, the initial training can be directed at these non-professionals. The paralegals will thus be learning the new systems first and can perform most of the computer terminal work, instead of the attorneys. This should ease the transition from manual to automated systems. The docket clerk had been involved with the system design of the CAMIS since the idea was first brought up, and she has been working with this system for three months. The CTA had also been informed of the progress of both the CAMIS and the LICS. Therefore, both of these personnel will be able to use the systems for their purposes as soon as they are even partially operational.

Security. Another area for possible concern is the security of any computer system. Information derived during case preparation will need some safeguards to prevent privileged information from becoming available to the opposing parties to the litigations. Passwords and file design information will have to be protected from compromise. Another aspect of security is the prevention of inadvertant loss of information on the computer. Back up tapes and printed copies of the information on the system should provide adequate protection.

Summary

A structured interview technique was used to accomplish a study of the information system requirements of the Directorate of Contract Appeals. The answers to the questions revealed an informal objective of establishing a litigation prevention program. The tasks of the attorneys were found to be essentially as published, and the few constraints on the responsibility and authority of the attorneys were recognized. The major decisions of the trial attorney when preparing for a case were found to be assessing the litigation risk, determining the proper level of discovery, and determining the legal issues at stake. Other decisions, often required, include evaluating witness capabilities, stipulations to issues not in contention, and motions to dismiss the case.

The information requirements for each of the decisions of the attorney were delineated, along with the external factors that affect the availability of this information. Further, the use of Information Support Services was evaluated to determine the adequacy of the available systems. The CTA believes that the JURIS system wil be able to support JAB better than FLITE has in the past. The information that is supplied to others by the attorney was also examined and found to be primarily concerned with case preparation. However, the CTA anticipates that more mater-

ial will be forthcoming from his office when the CAMIS is fully operational.

One characteristic desired by interviewees for improved information systems for JAB is the capability to rapidly input and process the full text of documents. The system should also consolidate the separate systems for workload assessment and case docket maintenance. Additionally, the systems should be able to regularly provide the attorneys with information on the upcoming due dates for each of the cases that are assigned. Finally, the requirements for training and data security were examined. Training can be directed primarily at the new paralegal personnel. Security requirements include protection of passwords from compromise and providing backup tapes for information in computer storage.

III. Implications of the Requirements Study

Need for Additional Research

The structured interviews with the personnel in JAB provided needed background and constraint information. However, many items could not be covered in detail within the time constraints for the interviews. This was because it was not considered appropriate to spend the additional time to cover all aspects of the system with each trial attorney. Also, as the study progressed, many more questions were brought to light. Therefore, only selected, key personnel were contacted on a continuing basis so that these details could be discussed. The personnel involved with these ongoing, informal interviews consisted of Colonel John Murphy (CTA), Mr. Glenn Woody (TA), a summer law student working with Mr. Woody, the docket clerk, the Word Processing Center supervisor, and selected trial attorneys.

In addition to the personnel in JAB, several more persons were contacted, since they were involved, in one way or another, with the activities at JAB or in similiar activities in other organizations. Such personnel included attorneys assigned to the Directorate of Procurement Law (AFLC/JAN) since it shares facilities and administrative cluster personnel with JAB. Programmers and supervisors in

the ASD computer center were contacted to determine the full capabilities of VENUS and to explore the possibilities of using the Information Central (INFOCEN) facilities in the place of VENUS. The Deputy for Administration (AFLC/DA) and his staff were contacted on matters involving the use of word-processing funding to procure additional or replacement equipment.

To gain the benefit of their experience, personnel involved with the procurement and operation of a shared-logic, word-processing system for the 2750 ABW accounting and procurement divisions were interviewed. Finally, information regarding prices, software availability, comparative capabilities, and other system features was solicited from the representatives of possible suppliers. This information was needed to determine base-line cost and feasibility of shared-logic, word-processing systems, to meet the requirements of JAB.

Research conducted for this study also included experiments in working with, or observing others working with, the CAMIS, LICS, and word processing equipment. As the programing staff implemented each subsystem of the CAMIS, the author assisted office personnel in "debugging" the system and investigating its suitability for fulfilling the requirements of JAB. Other personnel used LICS to prepare for cases. Finally, advanced word processing equipment has been used by office personnel on an experimental basis. It

was in the course of these activities that many of the measures of effectiveness, discussed in subsequent chapters of this report, were derived.

Finally, additional literature on office systems (Data-Pro: Office Systems, 1977) was consulted to compare the capabilities of other word-processing systems with the requirements of JAB. Since any procurement action, taken as a result of this and other studies, will most likely be by advertisement, some indication of the number of possible suppliers was needed. Also, the capabilities to be specified in a Statement of Work (SOW) were determined with the help of information in this reference.

The information flows at JAB and the specifications for the minimum requirements, given in the remainder of this chapter are derived from both phases of the requirements study. However, most of the details were developed during the second phase of the research. Additional results of this phase are included in the evaluation of the alternative systems in Chapters IV and V.

Information Flows in JAB

The results of the requirements study have led to the identification of the information flows in JAB. Figure 2 shows the sources and identification of the primary inputs and outputs of a trial attorney. As was expected, the flow chart indicates that the attorney is the focal point for

FIGURE 1: Information Flowchart During Case Preparation

most of the activity. In complex cases these information flows can generate thousands of documents, and good systems are needed to assist the attorney. These professional employees felt that they should not be required to perform tedious manual duties such as indexing, storing, and retrieving documents. The systems should not only relieve him of such encumbrances, but also redirect the information coming into the office to filter out some of the irrelevant material. (See the discussion under Attorney Decisions in Chapter II.)

The flowchart indicates that ISS systems are already available to assist the attorney. The lawyers, proficient in the use of such systems, have streamlined one major area of information inputs. If the other input channels can be directed through an appropriate system of paralegal personnel and information management systems, the workload of the attorney should be lessened. Most importantly, an orderly, properly filtered, flow of information should enable the attorney to concentrate on the tasks that require his particular expertise. Therefore, JAB has indentified 32 tasks, currently performed by the trial attorneys, that could be accomplished by trained paralegals. These tasks are listed in Appendix B.

The goal of the CTA in instituting these changes is to increase the overall productivity of the office. This should lead to a less tense work environment, where the

attorneys may work fewer hours and yet improve their preparation for cases. They should be able to produce more effective pleadings, motions, and briefs. According to Ms. Ruprucht, in order to accomplish this goal a ratio of attorneys to paralegals of two to one would be required - if manual systems were used by the staff. However, if an automated system could be fully implemented, the the ratio could be increased to four to one (Ruprucht, 1978:18). The savings that are possible depend on the systems employed, and this is discussed in more detail in Chapters IV and V. Since the cases processed by JAB are worth millions of dollars, only a small change in the Government litigation risk could result in significant savings to the Air Force. Therefore, regardless of the savings that might be possible with automated systems, the overall concept of using paralegals will be employed by JAB in the near future.

Automated System Specifications

There are three, formal, information systems currently employed at JAB. The first system is the docket maintenance system. Since this system contains the information required for the second system for case status information, the two systems will be described as one, called CAMIS. CAMIS will also be used in the litigation prevention program, as the necessary data will also be in the docket data base. The following are base-line capabilities required in

any litigation management software to fulfill the requirements of CAMIS and LICS.

CAMIS Storage. Random access, file storage for the data should be sufficient to store 300 records of 2700 characters each. The individual field names total approximately 200 additional characters. The total random access storage requirement would therefore be approximately one million characters. In addition to this random access storage, provision should be made for long access storage of records for cases that have been closed. This is to clear disk storage space and thereby keep the amount of random access storage to a minimum. The entire case record should be easily transferred to the closed case file when the case is retired. Finally, backup storage should be available for both storage systems to guard against any inadvertant loss of data. The time to reconstruct the data files on current cases should be less than four hours to prevent serious disruption of the office routine.

CAMIS Programs. The programing supplied to utilize this data base should be independent of the data base itself. It should be modular in construction to facilitate changes that might be required in the future, if it is not inherently versatile. The programs should include, as a minimum, the capability to select records on the basis of the contents of any data element (field). In addition, the selection (sorting) capability should permit stringing at

least ten different search criteria. This will enable the selection of records fitting multiple catagories. The operator should be able to count the number of qualifying records and sum the values of any numeric fields in those records. Finally, in order to implement the case status subsystem of CAMIS, the programs should be able to produce partial records for each attorney, sorted by case status.

LICS Storage. The other system desired by JAB is an expanded capability system based on the LICS. This system would require random access storage for nine million characters, with the capability to temporarily expand to ten million characters. This will permit storage and manipulation of the data for nine relatively complex cases at one time, and allow the possibility of ten. The total information storage requirement has been estimated by Mr. Woody to be fourty million characters. It is believed that using random access storage for this many characters would be prohibitively expensive. Therefore, some form of storage having longer access time will be needed to permit storage of the data on the other cases.

LICS Programs. The programs that would be required to operate on this data are basically the same as those needed for CAMIS. However, if full-text storage of documents is to be utilized in the future, there can be no limits on the size of the individual fields. (VENUS is limited to 250 character fields). This requirement is necessary to enable

searches of the entire document for the existence of selected character strings. Also, the search criteria should permit the use of "universal characters" such as * to indicate other acceptable forms of the selected character string. An example of this would be using 'contract***' to search for 'contractors', 'contracting', 'contraction', or other desireable words with the root 'contract'. The VENUS programming system accomplishes this automatically by using a "contains" search option.

Alternative System Configurations

There are two system configurations that were examined to fulfill the requirements of JAB. The first configuration is an adaptation of the existing equipment in the office, using the computer capabilities of the ASD computer center. The primary advantage of this approach is that the programs and data base management system are currently available and would only require minor modification. The one disadvantage of this approach is that the subject of word processing equipment is not addressed. There may be cost advantages inherent in any equipment configuration that also includes these capabilities, since the Directorate is currently planning to upgrade the equipment currently used for this purpose. This alternative is discussed in detail in the next chapter.

A second alternative is to buy, or lease, a commercially available, shared logic, word processing system. This type of system, as recommended by Ms. Ruprucht (Ruprucht, 1978), would not only provide most of the necessary information management systems, but also provide the capabilities required for word processing. The CAMIS system could not be readily adapted to this type of equipment but could be operated, using VENUS, with the current equipment. Additionally, INFOCEN facilities could still be accessed with the CAMIS equipment and one extra floppy disk reader. The information about the cost of this equipment, the required litigation support applications software, and other factors is given in Chapter V of this report.

Summary

Additional research was required to complete the requirements study for JAB and prepare for the evaluation of alternative systems configurations. The research was in the form of unstructured interviews and discussions with key personnel in JAB and other agencies involved with equipment use or procurement for the office. Also direct experience was gained by working with, or observing others working with, the CAMIS, LICS, and word processing center equipment.

The results of the completed requirements study and an evaluation of the information flows in JAB led the CTA to

desired changes in the organization of JAB. By employing paralegal assistance for the attorneys many advantages can be gained. Futhermore, it has been suggested that automated systems could reduce the required number of paralegals and thus allow the additional capabilities to be produced at a lower cost.

Experience gained in working with the LICS and CAMIS led to a set of specifications for the systems desired by JAB. These include system capabilities that would be required for fully operational systems. The final outcome of the requirements study was the identification of the two alternative system configurations that are evaluated in the remainder of this report.

IV. Evaluation of Configurations Using Computer Center Facilities

Definition of Alternatives

For the purpose of this evaluation, all equipment configurations utilizing time sharing of a remotely located, central processor will be considered as one alternative system configuration. While there is more than one system available at the computer center, and many types of interface equipment, the primary alternatives are the shared use of a central processor or having dedicated equipment just for the Directorate. The differences between the two equipment approaches is highlighted by the possibility of using word processing funding and acquisition procedures for dedicated equipment. On the other hand, if the systems use computer center facilities then a larger portion of the costs would have to be funded as Automated Data Processing Equipment (ADPE). This distinction is of primary importance to JAB since ADPE funding is difficult to obtain and some word processing funding is already available for upgrading equipment in the office. However, since the configuration cannot be selected on funding considerations alone, both alternatives are thoroughly analyzed in this and the following chapters.

Measures of Effectiveness Used in the Evaluations

In these evaluations the ability of each equipment alternative to fulfill the desires of JAB is discussed in relationship to a set of Measures of Effectiveness (MOE) developed specifically for this purpose. The MOE are classified by the ability to measure the attributes of the system. Relative costs and some of the individual capabilities could be accurately measured and compared. However, many of the other characteristics were difficult to measure on any absolute scale. Their impact, however, was considered so important that they could not be left out of the analysis merely because of measurement difficulty. In any case, the advice that "any output which can be identified should be measured" (Gigch, 1978:108) was followed, as much as was possible.

The "hard" MOE used were required expenditures, personnel required, and the ability to meet the baseline requirements listed in Chapter III. The required expenditures were classified as acquisition cost, rental or lease costs, service charges, and maintenance costs. Supplies such as paper, ribbons, and electric power were not included in the analysis since significant differences did not exist between the alternatives. Also, oportunity costs are not included among the "hard" attributes but are considered, where relevant, as "soft" variables.

Other "soft" measures, those difficult to quantify or scale, include time requirements for operations, relative ease of operation, maximum field length, capabilities in case of equipment failure, word processing capabilities, security, and intrasystem compatibility. Finally, the actual capabilities of the various software that is available under different equipment configurations could only be compared through published literature or a small amount of actual use. This tended to make these capabilities difficult to evaluate, and, therefore, these measures were the "softest" encountered.

The vehicles used to evaluate the equipment configurations against some of these "soft" measures are the list of paralegal duties, the duties of the docket clerk, and the word processing center tasks. In each case the ability of the system to facilitate the performance of these duties is the primary measure of the value of the system to JAB. Therefore, in the analyses that follow, the LICS, CAMIS, and word processing subsystems are discussed individually, even though some of the software has capabilities that could be used for more than one of these subsystems. This method of analysis also shows how some different approaches might be used simultaneously for different subsystems. The remaining "soft" measures and the base line requirements are the basis for the material contained in the section on equipment limitations.

LICS Results

Experiments. During the course of this study, Mr. Woody has utilized the LICS to assist in processing two appeals. In the first case selected sections and abstracts of the hearing record were inserted into the computer file. Then, in the process of writing the brief for the case, the information was selectively recalled with all of the information relating to each issue arranged together. Even though the selection capabilities of VENUS were not thoroughly excercised, the results were believed to be very valuable. Mr Woody felt that he was able to write a "more effective and throughly documented brief." Additionally, the specific citations used in the brief were easily inserted into the handwritten draft by merely cutting them from the computer printout.

For the second case, LICS was employed as soon as the case was assigned. A law student assisting Mr. Woody for the summer was given the responsibility for working with the system to create a complete document index with relevant abstracts. It must be noted that as a law student he has a good deal more experience than could be expected from a typical paralegal. However, with this in mind it was possible to analyze how the LICS could help a paralegal, and the inherent problems in the system were observed and documented. Finally, to test the possible uses of the system as other aides to the staff, selected uses of the

system were exercised with dummy data. Attorneys were then questioned about the possible usefulness of the output as if the data represented actual case facts.

Effects on Paralegal Duties. The list of paralegal duties in Appendix B contains several items that involve the capabilities of LICS. Foremost, item twenty involves the establishment and maintenance of an information management system (IMS) for the appeal. The alternative to using a computer based system for this task is to use manual procedures. What the LICS is able to do is make such an IMS more useful in performing other tasks. It was immediately obvious that the actual effort needed to perform task twenty would be greater with the LICS than with a manual system. This effort is that required to actually insert the data into the computer storage system. To alleviate the increased tasking for the paralegals, typists from the administrative cluster can be utilized to perform the actual data inputs. The cost of doing this has been estimated at .8 typist per week to cover the current case workload. Inefficiencies in assigning and scheduling work would probably result in additional costs, therefore an additional system cost of one typist will be used in this evaluation.

By analyzing the other tasks, an evaluation of the potential of LICS is possible. It was observed that LICS can assist in identifying and preparing to interview

potential witnesses. The capabilities of VENUS can be utilized to sort the documents by senders, receivers, and issues. Therefore, the attorney or paralegal can get a clearer picture of the personnel and their involvement in the situation leading to the appeal. In the review of the Rule 4 file for completeness (item 5), the paralegal would be assisted by the capabilities of the system to maintain indexes, and check the "tie ins" to the issues as outlined by the CO. LICS would also be useful in preparing exibits, checking cites for correctness and maintaining a chronological statement of the facts (items 21, 29, and 31) because of the capabilities of the system to generate new indexes on demand and rapidly recall applicable records dealing with multiple search criteria.

CAMIS Results

Experiments. During the time of this study the programs necessary to implement the basic features of CAMIS were developed and refined. The data for the current cases is now in computer storage, and VENUS has been used to create an experimental quarterly report. Some additional programming is still required, but the feasibility of each type of program has been checked. However, one general point can be made about the overall capabilities of VENUS. It is not a system specifically designed to produce the information required for CAMIS. Its general capabiliities

allow the information to be extracted, but complicated searches may require more than twenty-five separate questions. While the docket clerk is now capable of framing the necessary question sets, for repetitive use these sets should be stored as batch programs. Since only the computer center has personnel available to integrate these question sets into workable batch programs, their cooperation is essential to the complete implementation of CAMIS.

Effects on Paralegal Tasks. All of the paralegal tasks dealing with dates (items 1, 7, 26, and 30) involve the use of information in the docket data base. Once the CAMIS is fully operational this schedule information can be supppled to the legal staff at least once a week. This could substantially reduce the necessity for keeping separate notes, reminders, or schedules by each attorney or the paralegal assigned to the case. While this could be expected to save some time, it may be offset slightly by the fact that the data base will have to be updated more frequently than in the past. It should be noted, however, that the CTA does desire more current information in the docket data base.

Effects on Docket Clerk Tasks. The docket clerk was previously responsible for maintaining the records, compiling the quarterly report, answering incoming inquieries on the cases, and supplying assistance to the attorneys by keeping them informed of events occurring when they were out of the office. The advent of CAMIS has allowed the

possibility of some additional tasks. The quarterly report can now be generated in less than one hour instead of more than eight hours. Also, maintaining the records will probably be easier, since information can now be entered as codes instead of full text. This will also help store more information in the data base in a smaller volume.

The major effect on the docket clerk is that many other duties are now possible with only small expenditures of time. Additional summary reports can be implemented in less than an hour. Trend detection in case numbers, value, or complexity will be possible when the data base includes an appreciable number of closed cases. This should occur in approximately one year of operation. Of particular importance to the CTA, he will have access to the information regarding issues, case facts, and attorney decisions that have had an appreciable impact on the litigation risk of the Government. This information can be summerized, over the entire file of closed cases, in only a few hours. It could take weeks to do this with a manual system.

Equipment Limitations

With the effects on staff duties identified, some actual characteristics of the present equipment can now be discussed. This equipment includes a CRT terminal, thermal character printer, and a modem for connecting to the data lines of the computer. The facility to which this

equipment is connected includes two Control Data Corporation (CDC) computers and various peripherals including line printers for batch output. To fully implement the systems, two additional terminals and modems would be required for use by the paralegal staff. This total configuration has some undesirable characteristics that would affect the ability of VENUS based systems to assist JAB personnel.

Foremost, VENUS is limited to processing records with fields containing less than 250 characters. The implications of this include an inability to handle full text inputs, or even long extracts, without breaking the information into segments of approximately three and one half lines. When this is done, as in the LICS, it creates serious inconveniences in searching the stored material. The searches are still possible but less powerful and harder to accomplish since search criteria must be duplicated for each segment. Additionally, if a search involved a long character string, qualifying records would be missed if the segment break occurred in the middle of the string. The CAMIS is also affected by this limitation, but to a lesser degree. This is because only five of the fields in the file would ever be over 250 characters. Also, if sufficient care is excercised, the individual comments that go into these fields would not be split by the segment breaks. To facilitate this procedure, sufficient room was incorporated in the design of the file.

One additional point needs to be made. While a VENUS based LICS is still feasible in spite of this limitation, some future uses of the system would not be possible using VENUS alone. However, the computer center Information Central (INFOCEN) facilities might be ulilized to handle full text inputs for further processing. This system, using different computers, is also available with the current equipment and is considerably more powerful. It does not have any practical limits on field length, and the program has already been tested to retrieve information from ASPR. The primary drawback to its use is that JAB would have to actually pay for the use of its facilities. The additional costs that might be incurred are covered in a subsequent section of this chapter.

The second limitation to the use of VENUS based systems involves the accessibility of the intercom connection to the computer center. If too many users of the system attempted to connect to the center at one time it took an average of 45 minutes to gain access. Fortunately, this problem appears to have been alleviated, at least temporarily, since the center instituted a time limit on inactivity for all the terminals. Users now have a total of fifteen minutes to perform each activity or else they are automatically logged off the system. Another encouraging factor is the planned installation of twelve additional lines to handle intercom traffic. However, no assurance is possible

that this problem will not resurface in the future, as more organizations make use of the system.

Another limitation of the computer center, CDC, equipment is that loss of data can occur when the computer fails. It is a peculiar characteristic of these computers that file damage may occur if changes have been made to the file and the computer fails before the files are closed. Special procedures have been implemented to limit the damage to the files, but some data can still be lost. The procedure is implemented every 45 minutes and takes three to five minutes to accomplish with the LICS and CAMIS. In the worst case all 45 minutes of input data is lost if the computer fails just prior to use of the procedure. There are no additional safeguards that can be implemented at this time to further reduce the extent of this problem.

The final factor influencing the value of this equipment configuration is that few word processing capabilities are inherent in the design of the terminals. Separate equipment for the word processing center is planned, and this equipment will effect the productivity of the center typists. This equipment has been justified in a process separate from this study. Therefore, instead of listing the effects on this activity in the analysis of this alternative configuration, only the additional capabilities possible with a minicomputer-based system are covered in the next chapter. Also the benefits of having some word

processing capabilities available to paralegal staff and other secretaries is covered as additional benefits of the minicomputer configuration.

Summary of Benefits

If the LICS and CAMIS were fully implemented using VENUS, the net effect on the productivity of the staff would be positive. The production of indexes for special uses; the availability of cross checks, summary information, and reorganized materials; and the date tracking information supplied by these systems are all valuable capabilities that would make the tasks of the paralegals easier to accomplish. The ability of the docket clerk to supply additional information to the office staff has been experimentally verified. Unfortunately, time constraints on this research, and a lack of additional experimental equipment, prevented an accurate measure of just how much these capabilities are worth. The best that can be done at this point in time is to estimate some possible cost savings and realize that some capabilities, such as extraction of historical information, cannot be duplicated with manual systems, without incurring prohibitive costs. As for possible savings, the consultant, Ms. Ruprucht, estimated that a net savings of four paralegal positions could be possible with a minicomputer system based on current attorney manning (Ruprucht, 1978;18). It must be noted, however

that such systems have capabilities not found in the equipment currently installed in JAB. As is shown in the next chapter, these additional capabilities could further increase the productivity of the office staff. Also, the equipment limitations detailed in this chapter would be expected to have adverse effects on the productivity of these personnel. Therefore, it appears reasonable that the net savings from the use of the current equipment would be slightly less than four positions.

Equipment Costs

As was stated in Chapter III, the programs and data base management systems for this alternative are already developed. Therefore, the costs of these efforts is appropriately disregarded in this analysis. Also, the cost of the required, future support from the computer center is not determined. This is because JAB is not required to actually reimburse the computer center for their programming efforts. There is, however, an opportunity cost for the Air Force that should be recognized in the analysis.

Other costs, not actually charged to JAB, must also be recognized as opportunity costs. The actual use of the central processor and storage media is not reimbursable with VENUS-based systems. An indication of the relative magnitude of the opportunity cost can be obtained by examining the charges that would occur if the system used INFOCEN

facilities. These charges are based on the industry standards and are designed to reflect the actual cost of operating the equipment. Additionally, these charges reflect needed programming support and would, therefore, recognize the other opportunity costs involved in this analysis.

The following cost data is based on an estimated ten million characters in storage with updates of .7 million characters per month. These estimates are based on the application of Air Force standards for productivity (AFR 4-2 Vol II, 1977,3-3) applied to one full time typist for inputting data for LICS and a retention period of approximately fourteen months. The data and updates expected by the docket clerk for CAMIS are also included in these estimates.

Storage charges ($50/mo./1000000 characters)..	$500
Update charges ($200/1000000 characterers)...	140
Central processor time (30 min x $3/min).(1)..	90
Other access charges ($10/update x 4/mo).(2)..	40
Connection charges (400 hrs x $1.80/hr)..(1)..	720
Monthly total.....	1490
Yearly total.....	$17880

(1) estimates based on current usage adjusted for increased activity with fully implemented systems
(2) complete update of files once per week

These charges would only be paid by JAB if the system actually used INFOCEN for all subsystems.

The actual expenditures that would be required, using VENUS alone, would be only the following equipment rentals.

Three terminals	$3228	
One printer	996	
Three modems	1152	
subtotal		$5376
Word processing center equipment		20779
Total yearly rentals		$26155

These costs are based on the shared use of two terminals and one printer by the paralegal staff and one terminal by the docket clerk. These costs include maintenance charges for all equipment. The word processing center equipment is as programmed by AFLC/DA to replace the existing machines.

If one-third of the material were to be located on the INFOCEN system to take advantage of the system ability to handle full text of documents, additional outlays might total approximately $5960 per year. Therefore, under these assumptions, an analysis of actual expenditures implies that the benefits of the system should be worth at least the following total outlays:

Equipment charges	$26155
INFOCEN charges	5960
One GS 4 typist.(includes fringe benefits).	11570
Yearly total outlays	$43685

Furthermore, some opportunity costs may be approximated by the remaining INFOCEN charges not actually incurred. This would add an additional $11,380 per year to the above totals. It must be emphasized that these figures are only estimates and they may be in error. Any change in usage of INFOCEN could have an effect in both INFOCEN charges and possibly in required typing support.

These costs are all subject to inflationary increases in the future, but they are offset by any savings that might occur through reduction in the number of required paralegals. Each new paralegal would earn approximately $14,500 per year, including fringe benefits, based on GS 6 step 4 rates. If only three positions could be avoided, then the net expenditures for the additional capabilities of the CAMIS and LICS would be approximately $200 per year. The net present value of the cost difference for the next five years, discounted at ten percent, is approximately $833. The benefits of a thorough litigation prevention program alone may very well exceed this figure by many thousands of dollars.

V. Evaluation of Configurations Using A Word Processor Minicomputer

Definition of Configuration Alternative

All equipment configurations employing a dedicated central processor for JAB are the subject of this chapter. Some of the subsystems may use time sharing of computer center facilities in this configuration. However, most of the work of the paralegals and the Word Processing Center (JAWPC) can be accomplished on a minicomputer-based, word processing system. The current state of the art involving this type of equipment, and associated software, is in constant change. This makes a complete evaluation of the potential of such systems difficult. Fortunately, some of the capabilities most relevant to the desires of JAB have been verified and documented in the literature and in experience at Wright-Patterson Air Force Base. The following discussion starts with the capabilities that have been verified and examines the expected effects on the personnel of JAB. In a subsequent section the additional capabilities that are now in advanced development are also evaluated for their possible effects on the configuration selection decision.

Current Capabilities of Word Processing Minicomputers

Word Processing Versus Data Processing. This discussion centers on only those capabilities of minicomputers that might be available using Word Processing funding and acquisition procedures. It must be noted that there is currently a debate in progress, in both the Government and private industry, about what exactly is word processing versus what should be termed data processing (Mandell, 1978;F-3). As noted in Chapter IV this distinction is of primary importance to JAB. The systems discribed in this chapter are believed to be properly considered as word processing. The final decision, however, can only be made at Headquarters Air Force or by the General Services Administration, and this has been done on a case-by-case basis in the recent past.

Capabilities for LICS. The information management functions of the LICS require only advanced word processing capabilities. It is these capabilities that can be found in word processing systems that share use of a minicomputer and are called shared logic systems. They make use of commercially available software for text editing and document retrieval. The "stand alone" equipment like that currently employed in JAWPC relies on a dedicated microprocessors for each device, and it is not capable of rapid searches of millions of characters of information like the advanced shared logic systems. This capability is needed

for efficient use of JAWPC files and to enable the paralegals to maintain information on the incoming documents to use them to the best advantage. The basic word processing software and equipment, that are integral parts of shared logic systems, can supply most of the desired capabilities. Any document or data record on the system disk storage can be accessed in seconds. However, the capability to form subfiles of selected information is limited with the basic software. The addition of sort and retrieval software to the minimum configuration can provide the capabilities needed to operate with the very large document files that would be involved in the LICS. They would not provide the full text, key word searches available with INFOCEN. However, until advanced search software is available, the CAMIS equipment could be used to access INFOCEN. The data would be prepared at the paralegal station on a floppy disk and then transferred to a floppy disk reader at the CAMIS terminal. This type of dual use of a word processing terminal has been employed in private law firms to increase the productivity of word processing equipment (Walse, 1978;66).

Capabilities for CAMIS. It would be possible to use the basic software for the requirements of CAMIS. This subsystem should not be incorporated into the word processing system, however, because of the following reasons. First, additional programming would be needed for file

management and report writer functions. According to guidance from AFLC/DA, these capabilities cannot be classified as word processing under current criteria. Secondly, as was noted in earlier chapters, the basic programming and procedures necessary for CAMIS have already been implemented. Also, the continuing programming support that is required is expected to be provided by the computer center at no billable cost to JAB. Third, the capabilities would be just as expensive if they were transferred to the word processing system. Fourth, the equipment used for CAMIS will be needed for JURIS and can be used for interim use of INFOCEN as mentioned above. Finally, the docket clerk would be affected very little by the text editing and document creation capabilities of a word processing terminal.

Capabilities for JAWPC. Shared logic word processors have some distinct advantages over stand alone systems that should be useful to JAWPC. The rapid search capabilites already mentioned would facilitate document creation when substantial portions of the document have already been stored by the paralegals or other office staff (Walshe, 1978b;270). This would most likely occur in preparation of briefs when using citations from the hearing record. The situation may also arise when preparing other documents such as motions or replies to Appellant motions.

Another characteristic of shared logic systems is the ease of operation caused by interactive operator control (menu selection) of the functions of the system. Instead of memorizing the required codes to perform operations, the operator enters into a "dialogue" with the machine. All of the options available at any given point in time can be listed for selection by the operator. Experience with the system in the 2750 ABW has also indicated that operator training requirements may also be less with this type of system than with a stand alone machine. Not only is the period of formal training shorter, but the time needed to acclimate the operator before peak efficiency is reached may also be less.

Additionally, Air Force regulations specifically recommend shared logic systems for centers whose work includes very long documents and a high frequency of revisions (AFR 4-2, 1977;3-5). Analysis of workloads in JAWPC over the last year verify a high frequency of very long documents and revisions that constitute 39 percent of the typing.

There are numerous additional capabilities of advanced, shared logic, word processing systems that may or may not be available with any individual stand alone machine. In any case, most of these would be useful to the center typists, but the effects are not individually very important. The overall cabilities of each system would have to be evaluated against the difference in cost during the

vendor selection process, if a shared logic system is selected for use by JAB.

Additional Capabilities Available in the Future

The capabilities discussed in the preceding section would approximate those currently available on the VENUS based LICS. The representatives of three potential suppliers of minicomputer systems have indicated that they are developing advanced search software. The general capabilities of this software would enable JAB to approximate the capabilities of INFOCEN. Since the one-time license for this software is expected to be approximately $10,000, this capability could provide significant price advantages once the software is available. An estimate of the technical risk involved in the development of this software is low, according to the vendors, and no serious time delays are therefore expected in availability of this capabilities by March 1979.

In any case, the current capabilities of word processing mincomputers can be readily expanded by changes in the software alone. Either new variations of the basic software or advanced capability, data management, software can be procured along with any necessary support. This should substantially reduce the danger of technical obsolescence with this type of equipment configuration.

Expected Effects on Staff Duties

JAWPC Typists. In addition to the effects of the CAMIS and VENUS based LICS given in Chapter IV, the capabilities of word processing minicomputers would be expected to have other effects on the staff of JAB. The net effect on the JAWPC typists may be estimated by examining the frequency of revision and relative occurance of long documents. With 39 percent of the work volume involving revisions and these revisions requiring one-third the time of original typing (according to AFR 4-2 standards), only 13 percent of the typing time would be effected. The extra advantages of shared logic systems over stand alones would, therefore, have minimal effects on the time for revisions. However, the JAWPC supervisor indicated that almost one-half of the work volume involves fairly long documents. If one-third of the material was already available in system storage, then time savings of approximately 15 percent might be expected. With three typists employed in the center the overall savings might may be almost one-half a typist under these assumptions. This savings may or may not occur at any one time depending on the actual number of typists needed. The savings may, however, be sufficient to avoid the necessity of a working supervisor.

Paralegals. Referring again to the list of paralegal duties in Appendix B, the expected additional effects of this system configuration may be determined. The tasks are

considered as they are listed, and no relative ranking of importance is therefore intended. Furthermore, it is assumed that formats will be stored in the system for all "standard" documents prepared by the paralegals.

First, Task 2, notification of potential witnesses, could be accomplished without the use of JAWPC typists by merely calling up a standard letter and filling in the blanks. Another possibility would be to provide the center typist with the storage location of the list of witnesses and their addresses. JAWPC could then automatically insert the proper information into the format and even produce the mailing envelopes with only minimal typing. Whatever procedure is employed the results would be similar for all the tasks involving standard letters (tasks 4, 6, 10, 11, 22, 26, and 32).

Tasks involving preparation of long documents (tasks 7, 13, 14, 15, 18, 28, and 31) may be aided by the ability of the system to recall standard formats and material already in the LICS that is to be inserted into the document. The paralegal would not need to memorize the format for these documents, and material from the files of LICS could be inserted by merely giving the file name to the typist. The net effects are expected to be quicker training of the paralegals and easier preparation of draft documents.

Summary of Expected Additional Benefits

With 15 of the 32 paralegal tasks affected by the word processing capabilities of this equipment configuration, additional personnel savings can be realistically expected. Using the consultant's estimates of four paralegal positions averted does not seem unreasonable under these conditions. The additional savings of one-half typist, identified in this chapter, is relevent to the selection of alternative configurations. However, the uncertainties involved in these estimates are large, and the actual savings are quite problematical.

Other conceivable savings might occur if JAWPC needed to expand in the future. An additional work station could be added to the system for approximately $5,000 less than the cost of an additional stand alone machine. Additionally, the typist responsible for inserting data for LICS could be employed for overflow work from the center instead of using workers from the administrative cluster as is currently done. The productivity for such work would be nearer to that of the center typists since the equipment would be the same and the actual editing could be done in the center.

Finally, if INFOCEN type capabilities are actually needed, and advanced search software can be procured in the near future, savings of approximately $2360 per year may be expected. This figure is based on industry norms of 36

percent of license cost per year for leasing the capability, as applied to the estimated 10,000 dollar software license. This figure was then subtracted from the INFOCEN charges as estimated in the preceding chapter. Again this is only a very rough estimate and should not be relied on heavily.

Equipment Costs

The following cost data is based on a representative word processing system using a minicomputer. The actual costs for a system from any one vendor may be either higher or lower than these figures. The actual selection of vendor would be accomplished by a thorough comparison of the relative capabilities and costs supplied by the companies responding to an invitation for bids. The costs of continued operation of the CAMIS using time sharing facilities is included to enable comparison of essentially equal, overall, capabilities for each alternative configuration. It should be noted that the docket clerk would have total use of one character printer that would not be provided with the alternative equipment configuration. This was required because the docket clerk can not share the use of the printer with the paralegals as was the possible with the other equipment. An additional floppy diskette would also be required to enable the paralegals to input data into INFOCEN through the terminal for CAMIS.

Basic system (includes CPU, 10Mbyte disk, basic software, terminal, dual floppy diskette,and character printer).....	$1719	
Four additional terminals	800	
Three additional printers	721	
Voltage regulator	47	
Additional 10Mbyte disk	416	
Automatic hyphenization	151	
Password protection	39	
Utility sort software	214	
Monthly lease cost	$4107	
Yearly lease cost		$49282
CAMIS equipment yearly rentals		2456
Single floppy diskette .(1).....		1296
INFOCEN charges		5960
One GS 4 typist		11570
Estimated first year costs		$70566

(1) Required to use CAMIS equipment for INFOCEN

Once again these charges include maintenance of both hardware and software. If the additional savings of $2,360 from the elimination of INFOCEN chages could be realized, the $1296 lease charge for the extra floppy diskette could also be avoided. Therefore, it is possible that total expenditures could be reduced to approximately $66,910 per year.

So far in this evaluation lease charges have been used instead of purchase prices because the equipment would probably be leased for a least the first year. It should be noted, however, that 50 percent of the lease charges for the minicomputer system could be applied to the eventual purchase of the equipment. Indeed, if the systems do provide the valuable capabilities and cost avoidance that

has been predicted, the logical choice would be to exercise the purchase option as soon as possible. If this is accomplished after one year of operation, and INFOCEN can be terminated at that time, the five year costs of the systems would be appoximately as follows:

Lease costs for first year	$49284
Purchase price (net of credit)	69932
2nd - 5th year maintenance	2690
CAMIS equipment rentals	10241
One year lease of extra floppy disk	1296
One year INFOCEN charges	5960
Purchase of license for additional softeware ..	9090
One GS 4 typist in all years	48245
Total discounted costs for five years	$196738
Average cost per year	$ 39348

note: All outyear costs have been discounted at 10 percent per year. Maintenance and typing costs are expected to increase with inflation.

These costs would be offset by the probable avoidance of four paralegal positions. The first year total of expected salaries for these positions is approximately $58,000. When these savings are discounted the average yearly savings over the next five years is $48,370. The net cost of the increased capabilities would, therefore, be less than the expected savings. Even if only three paralegals could be avoided then the discounted savings would be approximately $36,280 per year. In this case the discounted cost of the additional benefits of computerized systems for JAB would be on the order of $15,000 for the next five years.

VI. Conclusions

Summary of Findings

The increased workload evidenced in JAB over the past several years has created difficulties for the assigned trial attorneys. These problems require long hours to remedy, and case preparation may have begun to suffer. At the same time, the CTA was urging even tougher stands on negotiations by requiring his approval on all proposed settlements. Additionally, little time was left for the conduct of an effective litigation prevention program, also desired by the CTA.

Instead of only bringing in more lawyers to ease the workload, the CTA directed experimentation with paralegal assistance and computerized information systems. It was believed that paralegals might be cost effective, and some outside consultants suggested that computerized systems might allow all employees to be even more productive.

The interviews conducted for this research verified that the attorneys felt that they were required to do too much sub-professional work. In addition, some individuals expressed the hope that automated information systems might increase their own productivity. Indeed, experiments with LICS indicated that such systems can assist the attorney in the performance of some tasks such as brief preparation.

The evaluations in this thesis concentrate on the effects of such information systems on the non-professional staff and management personnel. The foreseeable effects on the attorneys were left out of the analysis because the lawyers would not typically have direct contact with the equipment. It is believed that the attorneys will not care how the informaiton is processed, as long as they can control the process through their interaction with the paralegals. Also, it is reasoned that having the new paralegals work with these systems will ease the transition period involved in the expected system changeover.

The results of the alternative equipment evaluations in this study indicate that an introduction of both pagalegals and computerized systems can be cost effective. Even under the assumptions of minimal personnel avoidance and high discount rates, either configuration could be employed with only minimal additional cost. This additional cost was measured against what would probably be required if only paralegal assistance were used to remedy the workload problems. For the additional cost the office would have the benefit of considerable management information supplied by CAMIS, a more productive Word Processing Center, and more complete and useful information supplied to the attorneys by the paralegals and the docket clerk. Figures 3 and 4 show a summary of the expected costs and benefits of each equipment configuration.

CONFIGURATIONS USING COMPUTER CENTER FACILITIES

YEARLY COSTS	
EQUIPMENT RENTALS	$26155
INFOCEN CHARGES	5960
ONE GS-4 TYPIST	11570
TOTAL YEARLY OUTLAYS	$43685
FIVE YEAR DISCOUNTED COST	$182160
YEARLY EXPECTED SAVINGS	
THREE GS-6 STEP-4 PARALEGALS	$43500
FIVE YEAR DISCOUNTED SAVINGS	$181390
FIVE YEAR NET COST	$770

SUMMARY BENEFITS

1. MANAGEMENT INFORMATION WOULD BE MORE ACCESSIBLE.
2. "MORE EFFECTIVE AND THOROUGHLY DOCUMENTED" BRIEFS ARE POSSIBLE.
3. PARALEGALS WOULD BE ASSISTED IN MAINTAINING SCHEDULE INFORMATION FOR THE ATTORNEYS.
4. PARALEGALS WOULD BE ABLE TO SUPPLY THE ATTORNEY ACCURATE, TIMELY, AND COMPLETE INDEX INFORMATION.
5. PARALEGAL TASKS INVOLVING WITNESS ARRANGEMENTS FACILITATED BY LICS.

Figure 3. Summary data for time sharing equipment

CONFIGURATIONS USING A WORD PROCESSING MINICOMPUTER

YEARLY COSTS	
LEASE COST OF EQUIPMENT	$53034
INFOCEN CHARGES	5960
ONE GS-4 TYPIST	11570
FIRST YEAR OUTLAYS	$70566
DISCOUNTED COST FOR YEARS TWO THROUGH FIVE	$126172
FIVE YEAR DISCOUNTED COST	$196738
YEARLY EXPECTED SAVINGS	
FOUR GS-6 STEP-4 PARALEGALS	$241850
FIVE YEAR NET COST (SAVINGS)	($45112)

SUMMARY BENEFITS

1. BENEFITS LISTED UNDER THE ATERNATIVE CONFIGURATION ARE ALSO AVIALABLE WITH THIS EQUIPMENT.
2. THE WORD PROCESSING CAPABILITIES AVIALABLE AT THE PARALEGAL TERMINALS ARE RESPONSIBLE FOR THE FOURTH PARALEGAL POSITION SAVED.
3. THIS CONFIGURATION IS EXPANDABLE AT LOWER COST.
4. ADDITIONAL SAVINGS ARE POSSIBLE IN THE WORD PROCESSING CENTER.
5. TYPISTS CAN BE MORE EASILY TRAINED ON THE SHARED LOGIC SYSTEM THAN ON THE STAND ALONE EQUIPMENT.

Figure 4. Summary data for minicomputer-based systems

Sensitivity Analysis

The evaluation of alternative configurations unfortunately relied on some assumptions and uncertain estimates. It could not be determined whether or not INFOCEN or other such software would drastically affect the office staff. The possible charges for the availability of these capabilities was included to determine if the systems would still be cost effective even if they were needed. As shown in the cost benefit analysis, this is likely to be true with either equipment configuration. Also, if these charges are removed from consideration, the apparent advantage in the analysis does not change to the use of time sharing equipment. The net effect is that both configurations would be even more cost effective if INFOCEN type capabilities were not really required or desired. A possible means of resolving this uncertainty is presented in the section of this chapter labled A Suggested Plan of Action.

Another possible source for error, or at least bias, is in the selection of a discount rate in the evaluations. This rate was selected because it is the current Government standard. However, it is not certain that this is really appropriate in this particular instance. Fortunately, the selection of another discount rate does not drastically affect the analysis. If three percent is used instead of ten percent, the discounted net present value of expenditures for the minicomputer increases to approximately

$210,775. However, the personnel saving from the avoidance of only three positions also increases to $205,195. This is a five year difference of only $5,580 instead of the $15,000 obtained using ten percent discounting. With the other uncertainties in the analysis likely to contribute more than this error, it may be safe to say that the analysis is relatively insensitive to the discount rate.

Selection of Alternative Configurations

It appears from the analysis in the preceeding chapters that the acquisition of dedicated equipment would be the most cost effective alternative. However, the configuration decision may be more complicated than selection based on cost alone. There are several other considerations involved in this decision. The personnel in JAB will have to strike some form of balance amoung these factors in order to come to a decision. These other factors are discussed in the following paragraphs.

First, JAB desires automated systems assistance as soon as possible but without taking unnecessary risks or incurring long run cost disadvantages. Systems based on time sharing facilities could be operative in only a few months and replacement word processing equipment could be selected from the available stand alone systems in a short time also. The technical risks involved are slight, but the equipment limitations could still be a source of possible

problems. Additionally, the long run costs favor the dedicated equipment approach.

Second, word processing funding may be more easily obtained than ADPE funding, but at least some capability can be funded without going through a long Data Automation Request approval process. Funding for the first terminal and printer is already available and could probably be extended. A second terminal and printer for use by the paralegals could be funded in a matter of months. The remainder of the funds, including INFOCEN funds, would probably take longer to arrange. On the other hand, at least some funds are already available for word processing, and they may be sufficient to cover the lease costs of the word processing minicomputer systems.

The third dilemma involves the uncertainty present in the evaluations. It cannot be proven, before actual use of the systems, how many paralegals will actually be required. JAB has a consultant's recommendations based on her prior experience with other legal offices. However, very few such firms have the same overall conditions and restraints as JAB. The Directorate could hire four paralegals and see what additional capability they provide. The CTA might then be able to see what additional effects might be expected if either automated systems was provided. The early training of these personnel in system operation would be sacrificed under these conditions. It would not be advis-

able to immmediately hire eight paralegals, and then examine the possibility of eliminating some of the positions. The vested interest of the personnel already hired might interfere with such an evaluation. In addition, most companies attempting to use elimination of personnel costs as justification for computerization have found it difficult to actually reduce the number of employees. It appears that avoiding hiring would be a much better approach.

Fourth, JAB desires independance from other agencies, such as the computer center, but the programming supplied so far has been specifically adapted for JAB. Programming supplied by an outside contractor would probably be adapted from currently available software. It might be easier to adapt to the programs than to change the programs themselves. This might lead to lower costs for the Air Force, if the opportunity costs of internal programming is recognized, but changes in office methods might have other, unforeseen costs.

Finally, the use of current equipment until a minicomputer could be procured might be possible, but that would necessitate a changeover and retraining at a latter date. On the other hand, there is some expertise in the office in the use of the current equipment that would ease the training requirements for this equipment. Additionally, the experience gained in using current equipment and programs might be useful in the retraining process. The use of this

configuration would acclimate the staff to working with computers and might even avoid the possibility of fear or mistrust of such devices causing problems in implementation. The changes would be made in reversible steps leading to a full capability system. If a minicomputer were immediately procurred, the staff would see a drastic change in only a short time, and this might lead to even more problems from fear and mistrust. Some people are resistant to any change, and the bigger the change the more likely the occurance of such resistance.

A Suggested Plan of Action

Although no clearly superior alternative was found in the analyses, it is still possible to formulate a reasonable plan of action for the continuance of systems implementation. The suggested approach that follows will not necessarily lead to the least expenditure of funds, but the avoidance of some possible pitfalls may be worth the additional costs. In addition, this plan provides at least minimum capability as soon as possible.

First, arrangements for hiring four paralegals would continue as is currently planned. At this time no one knows just how soon any of these personnel can be located, but JAB can be ready to make the fullest use of their talents when they arrive. The second step would be to move the equipment currently installed from its present position

to the proximity of the desk of the docket clerk. This would enable the docket clerk to fully utilize the capabilities of CAMIS as soon as possible. The equipment could still be used by the law student assisting Mr. Woody if it were not actually placed where only the docker clerk could use it.

The next step to be taken is the submission of detailed justification for the word processing minicomputer. At the same time arrangements might be made to rent addtional stand alone machines for the Word Processing Center to replace two of the older machines. These rentals would be only for a short term until the shared logic system could be installed. This should not cause great difficulties in training, since all of the current typists are leaving soon and must be replaced. It is believed that the new personnel can be trained more easily on the stand alones than on the older machines, and the use of such equipment should reduce the training that will eventually be required for the shared logic equipment.

Since the justification, advertisement, and procurement processes are expected to take several months, arrangements can be made for the interim use of another set of equipment, like that currently in use, for the LICS. This would enable any paralegals hired in this time period to commence using LICS, with VENUS programmming, as soon as possible. It might also enable JAB to experiment with the use of

INFOCEN, if funding and the cooperation of the computer center could be arranged. This capability could then be tested before JAB committed funding to the purchase of advanced key search software for the minicomputer.

Finally, since it is not recommended that the CAMIS be implemented on the minicomputer, the computer center programming staff can be informed of the remaining tasks for the complete implementation of this subsystem. Even if these programs could be transferred to the minicomputer at some latter date, the basic techniques employed may be similar. If this happens, then the personnel responsible for the changeover could benefit from the prior experience.

Suggestions for Futher Research

The full capabilities of CAMIS have not yet been tested. It will take some time before sufficient closed cases are in the data base to use the system in a litigation prevention program. There are no current plans for storing data on cases closed prior to July of this year. Therefore, a complete evaluation of this system must be accomplished later. However, an independent researcher could obtain the data from many years of past cases. This data could then be selectively inserted into the CAMIS data base through any terminal on base. It would not be necessary to store all the data in each record on the computer before the capabilities of VENUS could be utilized to extract many

kinds of useful information about the factors influencing these cases.

One final point may be important. These records contain not only information on cases that were decided by the ASBCA but also the even larger number of cases that were settled by negotiation. To the knowledge of this author, this is the only data base that contains this information.

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Appendix A

Requirements Study Questions

1. The mission of the Directorate of Contract Appeals is to represent the Air Force before the ASBCA and to review proposed final decisions of Air Force Contracting Officers. Without describing the specific tasks that you do, do you consider this a complete statement of the mission of JAB? If not, what additions or modifications do you feel may be needed? Are there any objectives, not currently part of the mission of JAB, that you feel should be included?

2. Do you feel that the list of tasks from the Trial Attorney's Guide Book is a complete list of your duties?

3. What is your perception of your responsibilities and the limits of your authority?

4. What are the primary decisions that you must make when you are preparing for a case? What are the information requirements for each of these?

5. What external factors limit the use of or availability of your information?

6. What likely trends may exist in these factors?

7. What tasks are required of you to gather, process, and use this information?

8. What specific uses are made of Information Support Services, such as FLITE, in performing each functional task?

9. What additional uses could be made of each information service in performing these tasks if minor changes could be made to the service?

10. Are there uses for which a service was not intended, but for which the service proves useful? Were any procedural changes made to accomplish this?

11. Are there uses for which such a service was intended, but for which it is unsuitable or ineffective? Why?

12. What specific effects would the failure of an information service have on each task? Are there backup sources of this information? In what ways are these backup sources inferior to the original sources?

13. What information do you supply to other organizations or to your supereviors? (Aside from formal documents to the contractors and the ASBCA). Does all of this information go through the Chief Trial Attorney?

14. How much time is spent generating information for others (including the CTA) as compared to the time spent on case perparation? Does this interfere with your primary duties?

15. What possible or likely changes do you foresee in your information requirements and in the information you supply to others?

16. Do you consider forecasts or trend detection of case activity levels, or type, important for your use?

17. What specific functions would you like to see incorporated in computerized systems for JAB?

18. Do you have any experience in working with computers? If so, how long ago was this experience and in what capacity? What computer products are you familiar with?

19. Do you have any recommendations that might help to gain your assistance and cooperation in this study?

The following questions relate to proposed, computer based, case information processing systems for JAB.

20. Do you feel that it is necessary for the attorney to maintain close direction over data entry for indexing case information?

21. Do you foresee a requirement for full text storage of documents, or would indexes and abstracts be sufficient?

22. What controls might be required on access to the stored data? Should certain information be protected during discovery?

23. Are there any other aspects of the case informaiton processing system that you consider important?

The following questions relate to the proposed CAMIS.

24. How often should the case information be updated?

25. Should the attorneys, the docket clerk, the CTA, or paralegals be responsible for gathering and recording the data for this system?

26. Do you feel that this data could be updated during the course of regular case review by the attorney?

Appendix B

Paralegal Tasks

1. Open the file according to standard operating procedure and identify all immediate "due dates".

2. Notify all potential witnesses of JAB's involvement.

3. Advise the CO and the Command Cousel of the requirements of the following: appeal data form, litigation report, and the Rule 4.

4. Arrange meeting with the CO to discuss preparation of the Rule 4 file.

5. Review the Rule 4 file for compliance with the following:
    a. Is the file properly indexed?
    b. Are the documents tied to the allegations in the CO's letter?
    c. Does it contain all relevent documents?
    d. Does it elliminate all irrelevent documents?

6. File Rule 4 with the ASBCA and the Appellant.

7. Determine if Appellant was properly notified of appeal and appealed timely. If Appellant did not appeal timely, prepare motion to dismiss using a standard form of motion.

8. When the complaint is received, identify all areas at issue according to the CO's decision and statements in the litigation report. Make a preliminary outline of the issues.

9. Identify from the litigation report, (and conversation with people that have already been identified) all persons knowledgeable on the issues and obtain the addresses of all these potential witnesses, and their code numbers, telephone numbers, etc..

10. Provide all these potential witnesses with the complaint, and relevant files or have them come in and review same.

11. Advise all potential witnesses of the necessity to help marshal the facts and documents.

12. Arrange to meet with all witnesses so that each and every allegation of the complaint can be answered. Articulate all possible counterclaims.

13. Prepare draft demands or excess cost assessments.

14. Draft the Answer. (This activity will probably be reserved only to the most skillful paralegals.)

15. Prepare a draft of the trial plan.

16. File the Answer.

17. Interview witnesses and summarize expected testimony.

18. Coordinate drafting of the Government's Discovery.

19. Coordinate the work of responding to Appelant's discovery.

20. Establish and maintain an information and document indexing, storage and retrieval system for the appeal.

21. Assist in final witness and exhibit preparation.

22. Schedule all witnesses for trial.

24. Keep track of exhibits during trial.

25. Summerize the testimony of each witness during trial to assist in cross-examination or rebuttal.

26. Communicate new schedules with witnesses during a long trial.

27. After trial, summarize and flag all key points in the trial transcript.

28. Brief simple issues and find companion briefs and other source material.

29. Check all cites for correctness and see that the brief is carefully proofed and that the format of the brief is according to standard operating porcedure.

30. Monitor all deadlines during the entire course of proparation for trial, trial, and briefing.

31. Draft chronological statement of facts from the board record.

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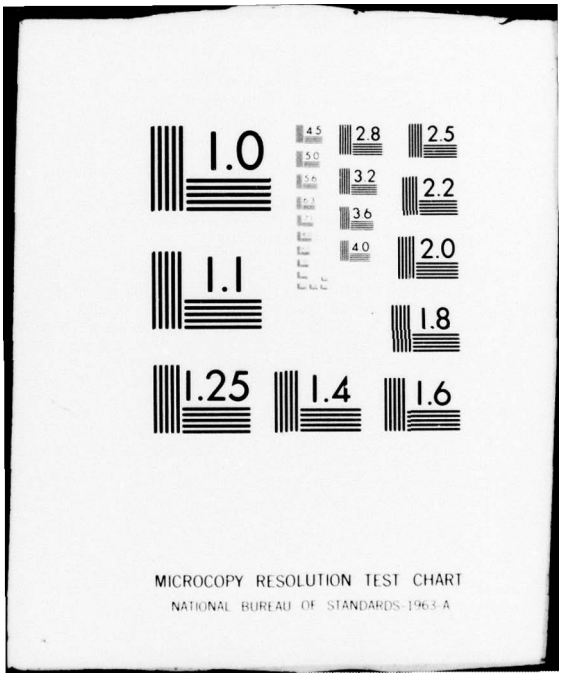
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32. Conduct routine communications with the ASBCA, counsel, and witnesses.

VITA

Ronald D. Vargo was born in Athens, Tennessee on April 24, 1947. He graduated from Phoenixville Area High School, in Pennsylvania, in 1965 and Drexel University, in Philadelphia, in 1970. His Bachelors degree is in Electrical Engineering.

After attending Officer Training School he attended Undergraduate Navigator Training and Electronic Warfare Officer's Training at Mather Air Force Base, California from June, 1971 to September, 1972. His first operational assignment was in EB-57 aircraft at Westover Air Force Base, Massachusetts. He was latter transferred to another squadron of EB-57s at Malmstrom Air Force Base, Montana where he served out his initial flying obligation. He was then assigned to the Air Force Institute of Technology in June of 1977.

Captain Vargo is married to the former Patricia Jones of Phoenixville, Pennsylvania. They have three children Brian, Jennifer, and Christine.

Permanent address: 63 Carson Street
Phoenixville, Pennsylvania
19460